

RIVERS AND FLOODS

By R. E. SPENCER

Floods during October, confined chiefly to the rivers of Texas, were in the main of little consequence. Exceptions were those in the Rio Grande and the Brazos, \$15,000 damage having occurred near Del Rio, Tex., on the Rio Grande, and \$14,000 in the vicinity of Waco, Tex., on the Brazos. The Rio Grande loss was the result of damage to dam construction works; that on the Brazos was distributed as follows:

Tangible property.....	\$7, 000
Unharvested crops (7,000 acres).....	5, 000
Suspension of business.....	2, 000

In addition, "considerable" crop losses are reported to have resulted from overflows along Brazos River tributaries.

High stages continue in the Trinity River at Dallas, Tex., as a result of dams used in levee work in progress below the gage.

The official in charge of the Weather Bureau office at Pittsburgh, Pa., comments as follows upon river conditions in his district: ¹

Navigation was suspended on account of low water in the Monongahela River above the seventh pool, about July 24, when it became impossible to maintain pool-full stages. On that date the lower gage at lock No. 10 showed 6.0 feet, which was 1.3 feet below the crest of dam No. 8, 11 miles below. By September 1 the stage at No. 10 had dropped to 4.0 feet, which was 3.3 feet below the crest of dam No. 8, and by October 1 the stage at No. 10

was down to 1.3 feet, and remained at that stage throughout the month, due to a pool formed by shoals about 1,000 feet below the dam. The only water feeding the pool was the leakage through lock and dam No. 10. The upper gage at lock No. 8 showed 0.8 foot of water October 31, which meant that the pool was empty. A stream flow measurement at lock No. 10, by the United States Army Engineers, the latter part of October, showed the flow to be 5 second-feet.

[All dates in October except as otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI DRAINAGE					
	<i>Feet</i>			<i>Feet</i>	
Republican: Concordia, Kans.....	8	15	15	8.2	15
Canadian:					
Canadian, Tex.....	5	12	12	6.0	12
Union City, Okla.....	7	13	14	8.2	14
North Canadian: Woodward, Okla.....	4	13	13	4.0	13
Ouachita: Arkadelphia, Ark.....	12	8	8	16.2	8
WEST GULF DRAINAGE					
Trinity: Dallas, Tex.....	25	8	8	25.8	8
Brazos: Waco, Tex.....	27	6	7	30.7	6
Colorado:					
Austin, Tex.....	18	{ 7	8	22.5	7
		{ 18	18	18.0	18
Columbus, Tex.....	28	{ 10	12	30.8	11
		{ 19	21	31.9	21
Rio Grande:					
Del Rio, Tex.....	10	{ 5	6	15.5	6
		{ 15	15	11.1	15
Eagle Pass, Tex.....	16	{ 7	7	17.1	7
		{ 11	12	23.7	11
San Benito, Tex.....	23	{ 19	22	24.1	21
		{ 25	25	23.0	25
		{ 31	31	23.0	31
Pecos: Pecos, Tex.....	11	19	19	12.0	19

¹ Cf. p. 401.

WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

NORTH ATLANTIC OCEAN

By F. G. TINGLEY

October may be said to inaugurate the winter season on the North Atlantic inasmuch as the average number of gales north of the forty-fifth parallel is sufficient to call for winter freeboard after the 16th of the month for vessels using the more northerly trans-Atlantic routes. There are, however, variations from one year to another in the number of gales as well as in their intensity and geographical distribution. In the month under review the number of gales reported was very close to the normal. More were reported than in October, 1929, but considerably fewer than in October, 1928, which was regarded as an exceptionally stormy month, especially over the middle and eastern portions of the ocean.

The distribution of pressure, as shown in Table 1, did not vary greatly from normal, except for the region north of the British Isles. Here low pressure prevailed, as shown by the negative departure of 0.26 inch at Lerwick, Shetland Islands. The average departure from normal for this group of 13 stations was, for the month under review, 0.08 inch. In October, 1928, a month of fewer gales, the group departure was 0.07 inch, while in October, 1928, just referred to as a stormy month, it rose to 0.10 inch.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level, 8 a. m. (seventy-fifth meridian). North Atlantic Ocean, October, 1930

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	<i>Inches</i>	<i>Inch</i>	<i>Inches</i>		<i>Inches</i>	
Julianehaab, Greenland.....	29.76	(1)	30.28	7th.....	29.18	19th.
Belle Isle, Newfoundland.....	30.01	¹ +0.14	30.48	8th.....	29.60	19th.
Halifax, Nova Scotia.....	29.98	² -0.06	30.38	8th ⁴	29.38	26th.
Nantucket.....	30.01	³ -0.07	30.30	12th.....	29.26	25th.
Hatteras.....	30.06	³ -0.04	30.36	22d.....	29.78	15th.
Key West.....	29.95	³ -0.01	30.16	31st.....	29.82	1st.
New Orleans.....	30.05	³ -0.01	30.50	31st.....	29.82	28th.
Cape Gracias, Nicaragua.....	29.83	² -0.09	29.94	21st ⁴	29.74	2d.
Turks Island.....	30.00	³ +0.05	30.10	21st.....	29.90	2d.
Bermuda.....	29.96	³ -0.11	30.18	29th.....	29.66	25th.
Horta, Azores.....	30.14	² +0.02	30.46	22d.....	29.48	14th.
Lerwick, Shetland Islands.....	29.53	² -0.26	30.46	2d.....	29.01	24th.
Valencia, Ireland.....	29.77	² -0.14	30.19	3d.....	29.12	17th.
London.....	29.86	² -0.05	30.42	2d.....	29.28	8th.

¹ No normal available.² From normals shown on Hydrographic Office Pilot Charts, based on observations at Greenwich mean noon, or 7 a. m., seventy-fifth meridian time.³ From normals based on 8 a. m. observations.⁴ On other date or dates.

Fog was reported on from 10 to 12 days over the Grand Banks; on from 5 to 6 days along the American coast north of Cape Cod, and on from 1 to 5 days over the central portion of the northern steamer lanes. Vessel reports received show only 5 occurrences of fog during October east of the fifteenth meridian.

The month opened with pressure distribution in the eastern part of the ocean completely reversed from the normal, high pressure overlying the region of Iceland and the British Isles and low pressure that between the Azores and Spanish Peninsula. This distribution occasioned moderate to fresh northerly to northeasterly gales between the Azores and English Channel. A moderate depression lay on the 1st between Bermuda and the Florida coast. During the period from the 1st to 5th normal pressure distribution was restored over the eastern part of the ocean, pressure falling from 30.40 inches to 29.12 inches at Vestmanna (Iceland), and rising from 29.88 inches to 30.40 inches at Horta. At the same time the depression in the western Atlantic moved northward with increasing intensity to the vicinity of Nova Scotia, where it prevailed on the 5th as a severe storm. On this day the Dutch steamship *Yselhaven*, in latitude $41^{\circ} 44' N.$, longitude $61^{\circ} 50' W.$, reported a southwest hurricane. Reports of other vessels involved in this storm will be found in the accompanying Gale and Storm Report. At least one casualty occurred in the fishing fleets of this region, the schooner *Lake O'Law* foundering on the 6th.

During the 6th and 7th the storm diminished in intensity and was forced to the southward apparently by the advance of a high pressure area from the continent. However, with some reinforcement from the southward it again acquired a northerly to northeasterly movement on the 9th and during the following days moved slowly to a position in midocean. On this part of its path it was attended by gales, chiefly on its western side, and for the most part only moderate to fresh in force. By the 15th it had again turned northward and had reached a position immediately to the south of Iceland. Meanwhile pressure had fallen over the entire northern part of the ocean so that the western depression appeared as the center of an extensive cyclone. Pressure at Vestmanna on the morning of the 15th was 28.80 inches and as far south as Horta was 29.78 inches, the entire ocean between Newfoundland and the British Isles being covered by a great barometric depression. The wind movement at this time, as reported by vessels within the region of low pressure, was for the most part moderate in character although a few vessels on the more northerly routes experienced full hurricane winds.

From the 15th to 18th low pressure prevailed in the southwestern part of the Gulf of Mexico, apparently being part of a general depression covering lower Mexico and adjacent waters of both the Pacific and the Gulf. On the morning of the 19th a center developed on the Gulf coast and during the day moderate to strong gales were experienced by vessels in the vicinity. However by the

morning of the 20th the disturbance had lost energy and on the 21st the entire Gulf, except the Bay of Campeche, was covered by the southern part of an extensive continental area of high pressure. With the southerly advance of this area a heavy norther prevailed at Tampico on the 19th and 20th and vessels were unable to enter port. Press accounts state that 10 vessels that had been held outside entered on the 21st.

Between the 15th and 20th pressure rose strongly in the region of the Azores and the northern depression moved very slowly eastward, with some contraction in size. On the latter date its center lay between Iceland and Scotland. On the 19th the British S. S. *Cameronia*, bound from Glasgow to Boston, reported a barometer of 28.32 inches and a westerly storm, force 11. This was in $56^{\circ} N.$, $12^{\circ} W.$ For the most part, however, only moderate to fresh gales were reported by vessels within the region covered by the depression. On the more southerly steamship routes the weather of this period was distinctly favorable.

After the 20th the northeastern depression spread to the southward and on the 22d a second center developed over the western Mediterranean. The whole of Central Europe and neighboring waters to the north and south thus came under cyclonic influence. However on the 26th a high-pressure area from the ocean pushed eastward over southwestern Europe and the close of the month saw anticyclonic conditions established over the whole of the western Mediterranean and adjacent continental regions. The advance of the HIGH caused a heavy northwest gale on the south coast of France on the 26th and 27th.

In the western Atlantic a depression developed northeast of Bermuda on the 23d and during the following day moved to the vicinity of the Grand Banks attended by northerly gales in the western quadrants. It was followed by a more energetic disturbance that formed to the southwest of Bermuda and which by the morning of the 25th had advanced to a position between Nantucket and Sable Island. This latter depression moved slowly in an east-northeast direction and on the morning of the 27th its center lay just to the south of Cape Race. Meanwhile its predecessor, moving more rapidly, had reached the vicinity of Iceland. These two disturbances caused moderate to strong gales over the western section of the trans-Atlantic steamship lanes from the 24th to 27th. After the latter date the second of the two disturbances advanced with some rapidity to the northeastward and merged with a low-pressure area lying between Iceland and the Scandinavian Peninsula. On the morning of the 31st the entire ocean, with the exception of a narrow belt along the American coast, was covered by high pressure.